

**INFORMATION STORAGE AND RETRIEVAL DEVICE USING
MACROMOLECULES AS STORAGE MEDIA**

5 ABSTRACT OF THE INVENTION

A storage device for the storage and retrieval of arbitrary sequences of binary information provides areal densities exceeding terabytes per square centimeter (TB/cm²) and even petabytes per square centimeter (PB/cm²) in a 3D configuration. The information is encoded in long strands of biological or non-biological molecules such as artificial DNA, RNA or other synthetic molecules that form a macromolecule. The strands are written in-situ and, in some cases synthesized in-situ, transported to and from read and write stations and memory locations on the device. The data is read out by detecting individual bases or collection of bases directly from the strand.